

DOCUMENT RESUME

ED 355 572

CS 508 102

AUTHOR Thompson, Philip A.
TITLE A Social Influence Model of Flaming in Computer-Mediated Communication.
PUB DATE Feb 93
NOTE 9p.; Paper presented at the Annual Meeting of the Western States Communication Association (64th, Albuquerque, NM, February 12-16, 1993).
PUB TYPE Speeches/Conference Papers (150) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Communication Research; Definitions; *Electronic Mail; Higher Education; Interpersonal Communication; Models; *Social Influences
IDENTIFIERS *Communication Behavior; Computer Mediated Communication; *Flaming (Computer Mediated Communication)

ABSTRACT

This paper explores the phenomenon of "flaming," which has been typically cited as an antisocial effect of computer-mediated communication. The paper discusses the diverse range of conceptual and operational definitions of flaming found in the literature. The paper offers a four-point critique of previous theoretical explanations of flaming, and suggests an alternative definition of flaming, which asserts both a behavioral and interpretive dimension to flaming. Drawing from the work of J. Fulk, J. Schmitz, and C. W. Steinfield, the paper then develops a social influence model of flaming that provides a more flexible and powerful approach than previous theories, while yielding potentially useful insights to guide future research. A figure representing the model is included. (Contains 56 references.) (RS)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

A Social Influence Model of Flaming in Computer-mediated Communication

by Philip A. Thompson

Department of Communication, The University of Utah, Salt Lake City, UT 84112

E-Mail: Philip.Thompson@m.cc.utah.edu (Internet), Panthony@UTAHCCA (BITNET)

A paper presented to the Western States Communication Association, Albuquerque, NM, February 1993

ED355572

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Phillip
Thompson

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as
received from the person or organization
originating it.
☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

CS508102

A Social Influence Model of Flaming in Computer-mediated Communication

by Philip A. Thompson

Department of Communication, The University of Utah, Salt Lake City, UT 84112

E-Mail: Philip.Thompson@m.cc.utah.edu (Internet), Panthony@UTAHCCA (BITNET)

A paper presented to the Western States Communication Association, Albuquerque, NM, February 1993

Abstract

This paper explores the phenomenon of flaming, which has been typically cited as an antisocial effect of computer-mediated communication. Previous definitions suggest a view of flaming as the exchange of emotionally charged, hostile and insulting messages. However, a diverse range of conceptual and operational definitions of flaming can be found in the literature. A four-point critique of previous theoretical explanations is offered, and an alternative definition of flaming is suggested, which asserts both a behavioral and interpretive dimension to flaming. Drawing from the work of Fulk, Schmitz and Steinfield (1990), a social influence model of flaming is developed. It is argued that this model of flaming provides a more flexible and powerful approach than previous theories, while yielding potentially useful insights to guide future research.

Introduction

With the proliferation of communication media in the twentieth century, considerable scholarly effort has been directed toward defining and assessing the impact of media on the process of communication. Much of this effort has explored hypothesized effects of media on those who use the media. This "media effects tradition" has not been without its critics (Anderson & Meyer, 1988, for example), yet effects research retains a prominent position in mass communication scholarship (Lowery & DeFleur, 1988). The search for effects continues to be pursued by those who study human communication mediated by computer technologies, such as electronic mail and computer conferencing, a growing research area that is generally referred to as computer-mediated communication (CMC).

Among the possible effects that have been discussed in the growing body of research on CMC, one of the most widely commented on, and perhaps least understood, is what is popularly known as flaming. Typically asserted to be an antisocial effect of CMC, flaming can be thought of as uninhibited behavior of CMC users that is revealed in the exchange of emotionally charged, hostile and insulting messages. This definition, however, is only tentatively offered as a starting reference point for those unfamiliar with the term. It will be argued that previous conceptual and operational definitions of flaming have been inconsistent, and the resulting ambiguity reflects a general lack of theoretical

consensus as to the nature of flaming. This paper then offers a four-point critique of previous attempts to explain flaming, suggests an alternative definition that incorporates both a behavioral and interpretive dimension in the construct, and develops a model of flaming which acknowledges the role of social influence. It will be argued that this model of flaming is more powerful than previous efforts in accounting for diverse empirical evidence, as well as more heuristically fruitful as a guide for future research.

Previous Definitions of Flaming

The term flaming apparently evolved from the "hacker" computer subculture; one of the earliest definitions found in the literature is offered in *The Hacker's Dictionary* (Steele, Woods, Finkel, Crispin, Stallman, & Goodfellow, 1983): "to speak rabidly or incessantly on an uninteresting topic or with a patently ridiculous attitude." Although this definition suggests flaming is merely an annoying peculiarity that should not be taken seriously, the term appears to have been broadened over time to include a variety of generally negative antisocial behaviors, including the expression of hostility, the use of profanity, and the venting of strong emotions.

Here are a few of the definitions of flaming that can be found in the literature on computer-mediated communication:

- speaking incessantly, hurling insults, [and] using profanity (Baron, 1984)
- the practice of expressing oneself more strongly on the computer than one would in other communication settings (Kiesler, Siegel, & McGuire, 1984)
- the hostile expression of strong emotions and feelings (Lea, O'Shea, Fung, & Spears, 1992)
- the tendency to react more critically or with greater hostility over this medium, leading to an escalation of conflict (Rice & Steinfield, 1990)
- heated, emotional, sometimes anonymous, venting by a participant (Selfe & Meyer, 1991)
- emotional outbursts of rudeness, profanity, or even exultation (Spitzer, 1986)
- the heated exchange of messages expressing hostility or defensiveness toward others on a computer network (Thompson & Ahn, 1992)
- insults, swearing, and hostile, intense language (Walther, 1992)

This diversity of definitions for flaming illustrates a general lack of conceptual clarity as to what constitutes flaming. Is flaming a behavior, a message characteristic, or a linguistic genre? Does flaming arise from a relaxing of inhibitions or an intensifying of hostility? Is flaming reflective of strong emotions, incessant banality or immature histrionics?

To be fair, theoretical constructs are inherently abstract (Judd, Smith, & Kidder, 1991) and perhaps the diversity of conceptual definitions should be of less concern than the extent to which researchers agree on operational definitions of flaming. Here the situation is not much better. In their reviews of past research, both Anderson and Walther (1992) and Lea et al. (1992) have noted that flaming has not been consistently operationalized in past research. Most studies have used some measure of uninhibited behavior. But while some have restricted their examination to negative emotional content by counting instances of insults and name-calling (Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Weisband, *in press*), others have included instances of positive emotional content as well, such as flirting and the expression of personal feelings toward others (Kiesler, Zubrow, Moses, & Geller, 1985). Sproull and Kiesler (1986) used self-report measures of "increased willingness to communicate bad news or negative information" and the "flouting of social conventions" (p. 1508). Lea and Spears (1991) counted uses of paralinguistic and incidences of swearing. Still others have used Interaction Process Analysis (Bales, 1950) to measure negative socioemotional content (Hiltz, Johnson, & Turoff, 1986; Rice & Love, 1987).

Certainly multiple operationalizations of a construct can be useful in establishing convergent and discriminant validity (Campbell & Fiske, 1959). Yet it is not at all clear that the research to date has led to convergence on flaming as a unidimensional construct. Instead, flaming appears to have been appropriated by researchers as a provocative term to use in the service of advancing a particular theoretical orientation. Flaming has been a "hot" topic for CMC research, but as the following critique suggests, we may have been burned in the rush to control the blaze.

A Critique of Previous Explanations of Flaming

A number of nomological nets have been cast to catch the elusive essence of flaming. Deindividuation theory (Festinger, Pepitone, & Newcomb, 1952; Zimbardo, 1969), which suggests that anonymity and reduced self-awareness leads to uninhibited behavior, has been cited as an explanation for flaming (Lea & Spears, 1991; Spears, Lea, & Lee,

1990; Sproull & Kiesler, 1991). So has social presence theory (Short, Williams, & Christie, 1976), which holds that the inability of CMC to transmit much of the social information present in face-to-face interaction leads to more impersonal communication (Hiltz et al., 1986; Rice, 1984; Steinfield, 1986). Other approaches that have been used to account for flaming include information richness theory (Daft & Lengel, 1986), which holds that media vary in richness of information, and the absence of social context cues hypothesis (Sproull & Kiesler, 1986), which suggests that a lack of social information in CMC contributes to uninhibited behavior.

This crowded theoretical milieu may have done more to confuse than to clarify our understanding of flaming. Further, the empirical support for these theories has been mixed. (For a review of the extant research on flaming, see Lea et al., 1992.) Explanations for flaming are almost as plentiful as definitions for this gossamer concept. As one recent critique put it, "in the rush to describe and catalogue effects, theories may have developed and become reified prematurely" (Walther & Burgoon, 1992). This general body of theoretical work has been criticized by others (Baldwin & Holmes, 1992; Culnan & Markus, 1987; Fulk, Schmitz, & Steinfield, 1990; Walther, 1992; Williams, Rice, & Rogers, 1988). The present critique focuses on four weaknesses of previous explanations of flaming.

First, the element of time is typically ignored. Most explanations of flaming have adopted some variant of what Culnan and Markus (Culnan & Markus, 1987) have called the "cues filtered out" perspective. Flaming is said to arise because some of the social and communicative cues used to regulate interaction and inhibit hostile behavior in face-to-face communication—like indicators of status, facial expression and tone of voice—are "filtered out" by the computer medium. But there is evidence that, given the time often denied them in experimental comparisons, CMC users develop strategies to overcome these presumed limitations (Blackman & Clevenger, 1990; Holmes & Berquist, 1990; Walther & Burgoon, 1992). Time may be a particularly important variable in understanding flaming in electronic mail discussion lists and other forms of asynchronous CMC, where interactions take place over relatively long periods of time.

Second, explanations of flaming have typically displayed a bias toward face-to-face communication. As Culnan and Markus (1987) point out, the "cues filtered out" perspective assumes that face-to-face communication is the standard by which CMC should be compared, and "ignores the possibility...that the electronic media have capabilities not found in face-to-face communication" (p. 431). In his study of computer conferencing at IBM, Foulger (1990) found evidence that computer media "allow

people to communicate in new ways, and perhaps more effectively than has been possible in the past" (p. 89). A perspective that begins with the assumption that face-to-face offers "the most" and CMC can only provide something "less" may miss valuable insights.

Third, previous explanations of flaming suffer from what Roth (1987) has dubbed "meaning realism." Flaming can be found in supposedly objective attributes of a message. A flame is a flame; all reasonable observers will be able to tell a flame apart from a message that is not a flame (a flicker, perhaps). It may be more appropriate, however, to look for flaming in the interpretation of a communication interaction, since flaming emerges when a reader attributes this quality to messages. In other words, a flame is not a flame until someone considers it to be a flame. Flaming does not exist in a vacuum; it requires the "fuel" of interpersonal interaction and the interpretation of that interaction by social actors. What distinguishes a message as a flame, then, is more than simply a characteristic of that message; it is also an emerging quality attributed to a sequence of messages by human actors involved in an interpretive process of meaning creation (Anderson & Meyer, 1988; Leeds-Hurwitz, 1992).

Finally, explanations of flaming have tended to make deterministic assumptions about how CMC affects communication (Baldwin & Holmes, 1992; Fulk et al., 1990). Computer communication media are seen as having relatively fixed, invariant attributes that influence all users in similar ways. Flaming is seen as behavior determined by technology, while possible social influences are minimized or ignored. But examination of social influences can be most illuminating (Compton, White, & DeWine, 1991). Lea and Spears (1991) argue that "earlier research underestimated the role of social contextual factors and normative processes in CMC," and that "compared with face-to-face interaction, the social and normative context may be of even greater importance in computer-mediated communication" (p. 299). Flaming may be related less to media constraints than to norms of a hacker subculture that values antisocial behaviors (Lea et al., 1992).

In sum, previous theoretical explanations of flaming have largely failed to incorporate the element of time, have exhibited a myopic bias toward face-to-face interaction, have suffered from meaning realism and have ignored the role of social influence. What research in CMC needs, claim Steinfield and Fulk (1990), is a stronger "theoretical infrastructure—a tree to which individual findings can be grafted to generate the synthesis and integration needed to support knowledge claims" (p. 13). The following theoretical model is an attempt to move toward that goal.

A Social Influence Model of Flaming

A perspective that offers promise in meeting the need for a stronger theoretical infrastructure, while responding well to the above concerns, can be found in Fulk, Schmitz and Steinfield's (1990) "social influence model on technology use." This model evolved from an earlier version, a "social information processing model" (Fulk, Steinfield, Schmitz, & Power, 1987), which in turn drew on the work of Salancik and Pfeffer (1978). While the model did not originally address flaming, an application of this theoretical approach for this purpose yields intriguing insights largely missing in previous efforts to explain flaming.

The social influence model departs from the "cues filtered out" approach and deterministic perspectives in general by arguing that the choices people make regarding technology use are "subjectively rational." Behavior is not simply determined by objective features of media, but is very much open to social influence. Fulk et al. (1990) argue that:

The limitation of traditional media use theories is their over-reliance on rational processes to explain the entire range of media-choice situations. A realistic understanding of behavior requires knowledge not simply of objective features of the environment, but also the social milieu that alters and adjusts perceptions of that environment. The advantage of the social influence model is its potential to explain a much wider range of media-use behavior across a greater variety of situations (p. 127)

Can the social influence model explain flaming? In order to apply the model, a definition of flaming as media-use behavior is needed. As noted above, flaming has typically been defined in terms of supposedly objective message characteristics. It is argued here that these are incomplete descriptions of flaming, in that they address an outcome of the flaming process, rather than the process itself. Further, the significance of this outcome is the result of social action, an achievement of meaning (Anderson & Meyer, 1988). Conceptualizing flaming as contingent upon an interpretive process of meaning creation, rather than as a property of a message, leads to the following definition: *Flaming refers to computer-mediated communicative behaviors that are interpreted to be inappropriately hostile.* This definition incorporates a common theme found in prior definitions—that of hostility—but adds that flaming requires an interpretive sense-making act, leading to a shared understanding that the expressed hostility is inappropriate in a given context.

As thus defined, flaming can be considered to incorporate two components of the social influence model: it is both a *media use* and a *media evaluation*.

Flaming is in part a use of CMC, requiring an application of CMC technology, such as crafting an electronic mail message for the expression of hostility. But flaming is also an evaluation of that usage, an interpretation that a message is inappropriately hostile in tone. Thus, two propositions of the social influence model can be brought to bear on an explanation of flaming. First, flaming as media use is a function of (a) media evaluations, (b) media experience and skills, (c) social influence, (d) task evaluations, and (e) situational factors. Second, flaming as media evaluation is a function of (a) media features, (b) media experience and skills, (c) social influence, and (d) prior media-use behavior (Fulk et al., 1990, p. 127). Note that two of the factors, media experience and social influences, are predicted to affect both flaming as media use (the creation of hostile messages) and flaming as media evaluation (the interpretation that a message is flaming). This model is graphically portrayed in figure 1. A discussion of each of the factors influencing flaming is presented next.

Differing levels of *media experience and skill* are likely to influence both flaming as behavior and flaming as an interpretive sense-making act. Those with extensive experience in CMC are likely to be more aware of proper "e-mail etiquette" (Goode & Johnson, 1991) than novice users, and thus less likely to inadvertently start a "flame war." Experienced users are also likely to have encountered a range of flaming behaviors, from a "mild scorch" to a "roaring blaze." This experience may temper their tolerance levels for hostile messages, influencing the interpretation of what constitutes a salient incident of flaming. Experienced users may have developed skills in "flame management," such as clearly delineating flaming content with the phrases FLAME ON and FLAME OFF (Sproull & Kiesler, 1991), or using pictographs (symbolic icons made with punctuation marks) to indicate a facetious tone (Blackman & Clevenger, 1990; Miller, 1992; Thompson & Foulger, 1993). Novice users may start flames by simply revealing their ignorance of CMC norms, such as typing in ALL CAPS (the electronic equivalent of shouting), failing to use descriptive message headers, posting personal messages to public forums, or sending "listserve" commands (such as "signoff," a command intended to be interpreted by a computer program) to a widely distributed electronic mail discussion list. Novice users may also fail to recognize attempts by experienced users to modify aggressive arguments (such as using IMHO before a comment, which is a common abbreviation for "in my humble opinion"), thus contributing to a flaming interpretation of messages that were intended to be only mildly assertive.

Social influences are also a factor in both flaming as behavior and flaming as interpretation. Fulk et al. (1990) identify four types of social influence: (1) direct statements by others, (2) vicarious learning, (3) group behavioral norms, and (4) social definitions of rationality. Flaming may be moderated (or intensified) by direct statements by others outside of a CMC context (Thompson, 1992). A hostile e-mail message from someone who is widely perceived as a "hot-head" outside the CMC context is likely to be interpreted (and crafted) differently than a flame from a "cyberspace cowboy" whose flamboyant use of CMC may be compensation for failures in interpersonal relationships (Turkle, 1984). Users of CMC may vicariously learn much about flaming before experiencing it firsthand — from hearing tales of past flames from colleagues, or reading about flaming in popular accounts. Groups that encourage aggressive argumentation may hold quite different attitudes toward flaming than groups that encourage passive acceptance of leadership; Lea and Spears (1991) have found evidence for the role of group norms in flaming. What is perceived as rational behavior in one CMC forum (the USENET newsgroup alt.flaming, for example) could be perceived as quite irrational in another. Lea et al. (1992) suggest that flaming may be reflective of a "computer hacker subculture" that embraces attitudes that "run counter to the expectations and standards of industrial or educational organizations from which perspective they might be considered deviant or uninhibited." Presumably, with the swelling ranks of CMC users, the hacker culture may become less dominant and flaming less frequent.

The model predicts that a user's *media evaluation* is likely to directly influence the behavior of flaming. Research has shown differences in the way people evaluate CMC's appropriateness for socioemotional communication (Rice & Love, 1987). Those who feel the medium is inadequate or inappropriate for the expression of emotions would seem to be less likely to craft flaming messages than those who may be more comfortable in expressing emotions in this manner. Flaming may also be related to anxiety or feelings of frustration in learning to use CMC systems (Siegel et al., 1986); a user who evaluates a CMC system as difficult to use may take out her or his frustrations in belligerent messages to anonymous others on a computer network.

Similarly, *task evaluation* may influence flaming as behavior. In some organizations, CMC systems are regarded as important channels for serious organizational communication, and flaming may be officially discouraged as an inappropriate waste of resources (Foulger, 1990). Other organizations may have a much "looser" attitude toward non-task use of CMC, even encouraging socioemotional communication in the desire to increase organizational

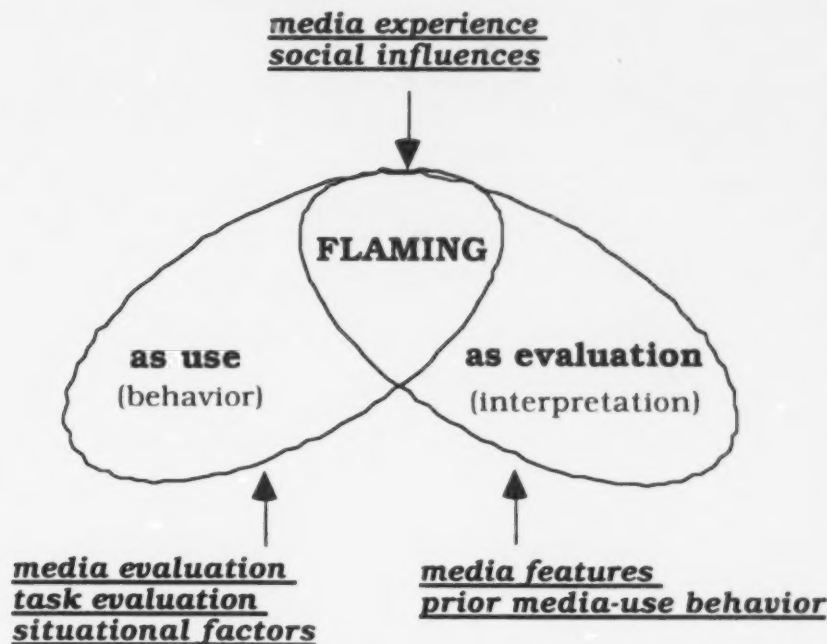


Figure 1: A Social Influence Model of Flaming

camaraderie (Sproull & Kiesler, 1991). Flaming behavior may vary in both quantity and quality in these two task evaluation contexts.

Situational factors may also influence flaming as behavior. As mentioned earlier, time may be a significant factor in flaming, especially in asynchronous CMC. Flaming may be influenced by the length of discussions, which may occur over days or weeks. The number of messages received in a given unit of time, the time between messages, and the time of day a message is read may be influential. Location of CMC use may also affect flaming as behavior. CMC users may access communication networks in a variety of places: at the office, at home, on the road. Flaming behavior may be less common in messages originating in "serious" locations, like an office, than in more casual settings. Situations also vary in the degree of privacy offered; flaming as behavior may be influenced by the presence of other people during a CMC interaction. There is some evidence that the mere presence of others influences CMC behavior (Robinson-Stavely & Cooper, 1990).

The model predicts that *media features* will influence the interpretation of flaming. Here support for the "cues filtered out" thesis may be explained: users may find CMC limiting and confining, at least early in the adoption of the technology. Socioemotional content may thus seem an inappropriate and irrational use of the medium, influencing the interpretation of

flaming behaviors. People may also vary in the degree to which they are aware of (or make use of) features of a particular CMC system. The interpretation of flaming may be influenced not only by supposedly objective features of the media environment, but also by subjective awareness of those features. Users also read messages on a variety of hardware and software configurations; the interpretation of flaming may differ between those who have a "user-friendly" electronic mail program with a graphical interface and those who read messages on outmoded systems that may have painfully slow display rates and lack mail filtering capabilities.

Finally, the model suggests that *prior media-use behavior* is a factor in the interpretation of flaming. How people react to and make use of other media may influence evaluations of CMC behavior. The interpretation of flaming may be influenced by

previous experiences with flaming-like behavior in other media, such as complaint letters and prank phone calls. People also bring to a flaming situation different expectations of the advantages and disadvantages of media use, based largely on previous experience; there is some evidence that pre-use expectations of media use influence media evaluations (Rice, Grant, Schmitz, & Torobin, 1990). Thus, prior media-use behavior may contribute to a set of interpretive rules which aid in the sense-making of flaming behaviors.

In sum, the social influence model of flaming developed here begins by defining flaming as both a media use (the behavior of flaming) and a media evaluation (the interpretation of flaming). Application of Fulk et al.'s (1990) social influence model leads to the predictions that (1) media evaluations, task evaluations and situational factors will influence the behavior of flaming, (2) media features and prior media-use behaviors will influence the interpretation of flaming, and (3) media experience and skills and social influences contribute to both the behavioral and interpretive dimensions of flaming. Modeling flaming in such a way enabled an explanation of many of the characteristics of flaming previously identified by research, provided a more comprehensive theory of flaming, and suggested some intriguing directions for future investigation.

Conclusion

This paper discussed the wide variety of conceptual and operational definitions of flaming, and offered a four-point critique of previous explanations. The paper suggested an alternative definition, incorporating both a behavioral and interpretive dimension, and developed a social influence model of flaming. This exercise has illustrated the need for a stronger "theoretical infrastructure" in order to account for diverse empirical evidence, while suggesting the potential of the social influence approach. Looking at flaming from the analytical vantage points offered in this model could yield further insights into a phenomenon that may be more complex and socially influenced than earlier assessments have suggested.

The approach outlined here is not without its weaknesses. The Fulk et al. (1990) model focused more on media choice than on media behaviors once that choice was made; the evidence remains limited for concluding that the extension of the model in the directions suggested in this paper are warranted. Further, the social influence model is less parsimonious than deterministic explanations. By seeking a richer, more complex explanation for flaming, research designs may need to become increasingly complicated, perhaps impractically so.

This point raises a critical concern: Is flaming a phenomenon that warrants the attention of scholars of communication? Perhaps the answer will depend on one's perspective. From a deterministic view, flaming may be assumed to be an effect of CMC, a dependent variable that is primarily the result of technological determinants. But from a social influence perspective, flaming may offer researchers a unique opportunity to advance our understanding of conflict and interpretive sense-making from within an environment that allows relatively unobtrusive observation (Rice, 1990). What we learn about flaming may help inform us about hostile behaviors in other contexts that may be of more direct social concern. For example, an understanding of the constructs contributing to the interpretation of flaming may help us better understand the interpreting of sexual harassment. Flaming may also provide a useful site for exploring the conflicts between "free speech" and "politically correct speech." And there may be value in exploring the legal implications of flaming as new policies for regulating CMC are established (Branscomb, 1991), and as public policy promotes the building of a national information infrastructure (Gore, 1991). These are just a few of the potential avenues for research on flaming in CMC, a phenomenon that invites further exploration—not simply as an effect of communication technology, but as a reflection of the social negotiation of meaning.

References

- Anderson, J. A., & Meyer, T. P. (1988). *Mediated communication: A social action perspective*. Newbury Park, CA: Sage.
- Anderson, J. F., & Walther, J. B. (1992, May). *Relational tone in computer-mediated communication: A meta-analysis of past research*. Paper presented at the meeting of the International Communication Association, Miami.
- Baldwin, C., & Holmes, M. E. (1992, May). *Social presence and verbal immediacy: A linguistic critique of media determinism*. Paper presented at the meeting of the International Communication Association, Miami.
- Bales, R. F. (1950). A set of categories for the analysis of small group interaction. *American Sociology Review*, 15, 257-263.
- Baron, N. S. (1984). Computer mediated communication as a force in language change. *Visible Language*, 18(2), 118-141.
- Blackman, B. I., & Clevenger, T., Jr. (1990, November). *The promises, possibilities and pragmatics of using pictograph surrogates in on-line messaging: Implications for managing the adoption of computer-mediated communication technology*. Paper presented at the meeting of the Speech Communication Association, Chicago.
- Branscomb, A. W. (1991, September). Common law for the electronic frontier. *Scientific American*, pp. 154-158.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56 (2), 81-105.
- Compton, D. C., White, K., & DeWine, S. (1991). Techno-sense: Making sense of computer-mediated communication systems. *Journal of Business Communication*, 28, 23-43.
- Culnan, M. J., & Markus, M. L. (1987). Information technologies. In F. M. Jablin, L. L. Putnam, K. J. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* (pp. 420-443). Newbury Park, CA: Sage.
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness, and structural design. *Management Science*, 32, 554-571.
- Festinger, L., Pepitone, A., & Newcomb, T. (1952). Some consequences of deindividuation in a group. *Journal of Abnormal and Social Psychology*, 47, 382-389.
- Foulger, D. A. (1990) *Medium as process: The structure, use, and practice of computer conferencing on IBM's IBMPC computer conferencing facility*. Ph.D. dissertation, Temple University.
- Fulk, J., Schmitz, J., & Steinfield, C. W. (1990). A social influence model of technology use. In J. Fulk & C. Steinfield (Eds.), *Organizations and Communication Technology* (pp. 117-140). Newbury Park, CA: Sage.
- Fulk, J., Steinfield, C. W., Schmitz, J., & Power, J. G. (1987). A social information processing model of media use in organizations. *Communication Research*, 14, 529-552.
- Goode, J., & Johnson, M. (1991, November). Putting out the flames: The etiquette and law of E-Mail. *Online*, p. 61-65.
- Gore, A. (1991, September). Infrastructure for the global village. *Scientific American*, pp. 150-153.
- Hiltz, S. R., Johnson, K., & Turoff, M. (1986). Experiments in group decision making: Communication process and outcome in face-to-face versus computerized conferences. *Human Communication Research*, 13, 225-252.

- Holmes, M. E., & Berquist, C. (1990, November). *Gender display in synchronous computer-mediated discourse: A case of channel constraints and opportunities*. Paper presented at the meeting of the Speech Communication Association, Chicago.
- Judd, C. M., Smith, E. R., & Kidder, L. H. (1991). *Research methods in social relations*. Fort Worth, TX: Holt Rinehart and Winston, Inc.
- Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, 39, 1123-1134.
- Kiesler, S., Zubrow, D., Moses, A. M., & Geller, V. (1985). Affect in computer-mediated communication. *Human Computer Interaction*, 1, 77-104.
- Lea, M., O'Shea, T., Fung, P., & Spears, R. (1992). 'Flaming' in computer-mediated communication: observations, explanations, implications. In M. Lea (Ed.), *Contexts of Computer-Mediated Communication*. London: Harvester-Wheatsheaf.
- Lea, M., & Spears, R. (1991). Computer-mediated communication, de-individuation and group decision-making. *International Journal of Man-Machine Studies*, 34, 283-301.
- Leeds-Hurwitz, W. (1992). Social approaches to interpersonal communication. *Communication Theory*, 2, 131-139.
- Lowery, S. A., & DeFleur, M. L. (1988). *Milestones in mass communication research* (2nd ed.). New York: Longman.
- Miller, M. W. (1992, September 15). A story of the type that turns heads in computer circles: Digital smiley faces are used in e-mail conversations by the lateral-minded. *Wall Street Journal*, p. A1, A11.
- Rice, R. E. (1984). Mediated group communication. In R. E. Rice & Associates (Eds.), *The new media: Communication, research and technology* (pp. 129-154). Beverly Hills, CA: Sage.
- Rice, R. E. (1990). Computer-mediated communication system network data: theoretical concerns and empirical examples. *International Journal of Man-Machine Studies*, 32, 627-647.
- Rice, R. E., Grant, A. E., Schmitz, J., & Torobin, J. (1990). Individual and network influences on the adoption and perceived outcomes of electronic messaging. *Social Networks*, 12, 27-55.
- Rice, R. E., & Love, G. (1987). Electronic emotion: Socioemotional content in a computer-mediated communication Network. *Communication Research*, 14, 85-108.
- Rice, R. E., & Steinfield, C. (1990). New forms of organizational communication via electronic mail and voice messaging. In J. H. Andriessen & R. Roe (Eds.), *Telematics and Work*. New York: Wiley.
- Robinson-Stavely, K., & Cooper, J. (1990). Mere presence, gender, and reactions to computers: Studying human-computer interaction in the social context. *Journal of Experimental Social Psychology*, 26, 168-183.
- Roth, P. A. (1987). *Meaning and method in the social sciences: A case for methodological pluralism*. Ithaca, NY: Cornell University Press.
- Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 23, 224-253.
- Selfe, C. L., & Meyer, P. R. (1991). Testing claims for on-line conferences. *Written Communication*, 8, 163-192.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. New York: John Wiley.
- Siegel, J., Dubrovsky, V., Kiesler, S., & McGuire, T. W. (1986). Group processes in computer-mediated communication. *Organizational Behavior and Human Decision Processes*, 37, 157-187.
- Spears, R., Lea, M., & Lee, S. (1990). De-individuation and group polarization in computer-mediated communication. *British Journal of Social Psychology*, 29, 121-134.
- Spitzer, M. (1986). Writing style in computer conferences. *IEEE Transactions on Professional Communications*, PC 29, 19-22.
- Sproull, L., & Kiesler, S. (1986). Reducing social context cues: Electronic mail in organizational communication. *Management Science*, 32, 1492-1512.
- Sproull, L., & Kiesler, S. (1991). *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press.
- Steele, G., Woods, D., Finkel, R., Crispin, M., Stallman, R., & Goodfellow, G. (1983). *The hackers dictionary*. New York: Harper and Row.
- Steinfield, C. W. (1986). Computer-mediated communication in an organizational setting: Explaining task-related and socioemotional uses. In M. L. McLaughlin (Ed.), *Communication Yearbook 9* (pp. 777-804). Newbury Park, CA: Sage.
- Steinfield, C. W., & Fulk, J. (1990). The theory imperative. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and communication technology* (pp. 13-25). Newbury Park, CA: Sage.
- Thompson, P. A. (1992, November). *An Episode of flaming: A creative narrative*. Paper presented at the meeting of the Speech Communication Association, Chicago.
- Thompson, P. A., & Ahn, D.-K. (1992). To be or not to be: An exploration of E-prime, copula deletion and flaming in electronic mail. *ETC: A Review of General Semantics*, 49, 146-164.
- Thompson, P. A., & Foulger, D. A. (1993, May). *Effects of quoting and pictographs on flaming in computer-mediated communication*. Paper to be presented at the meeting of the International Communication Association, Washington, DC.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction. *Communication Research*, 19, 52-90.
- Walther, J. B., & Burgoon, J. K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research*, 19, 50-88.
- Weisband, S. P. (in press). Discussion, advocacy and computer-mediated communication effects in group decision making. *Organizational Behavior and Human Decision Processes*.
- Williams, F., Rice, R. E., & Rogers, E. M. (1988). *Research methods and the new media*. New York: Free Press.
- Zimbardo, P. G. (1969). The human choice: Individuation, reason, and order versus deindividuation, impulse, and chaos. In W. J. Arnold & D. Levine (Eds.), *Nebraska Symposium on Motivation: 1969* (pp. 237-307). Lincoln: University of Nebraska Press.